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<110> Fishman, Jay A.

<120> MOLECULAR SEQUENCE OF SWINE RETROVIRUS
AND METHODS OF USE

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<150> US 09/661,858
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<213> Artificial Sequence

<220>
<223> Primer

<400> 40
gctcacctgg acccgacrgc cc 22

<210> 41

<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 41
gggcagtcgg gtccaggtga gc 22

<210> 42
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 42
gtttacggga cgggcagcga tggc 24

<210> 43
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 43
gccatcgctg ccgtcccgt aaac 24

<210> 44
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 44
tggctggggc ggcggtggtg gacggg 26

<210> 45
<211> 26
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 45
cccgtccacc accgccgccc cagcca 26

<210> 46
<211> 24
<212> DNA

<213> Artificial Sequence

<220>
<223> Primer

<400> 46
gcccaaagcc ccagaaccca gacg 24

<210> 47
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 47
cgtctgggtt ctggggcttt gggc 24

<210> 48
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 48
gatgaacagg cagacatctg 20

<210> 49
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 49
cgcttacaga caagctgtga 20

<210> 50
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 50
agaacaaagg ctgggaagc 19

<210> 51
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 51
ataggagaca gcctgaactc 20

<210> 52
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 52
ggaccattgt cgtagcctat 20

<210> 53
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 53
gtcaacacct ataccagctc 20

<210> 54
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 54
catctgaggt atagcaggtc 20

<210> 55
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 55
gcaggtgtag gaacaggaac 20

<210> 56
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 56
acctgttgaa ccatcccica 20

<210> 57
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 57
cgaatggaga gatccaggta 20

<210> 58
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 58
cctgcatcac ttctcttacc 20

<210> 59
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 59
ttgcctgctt gtggaatacg 20

<210> 60
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 60
caagagaaga agtggggaat g 21

<210> 61
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 61

cacagtggta caccacgcag 20

<210> 62
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 62
gggagacaga agaagaaagg 20

<210> 63
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 63
cgatagtcat tagtcccagg 20

<210> 64
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 64
tgctggtttg catcaagacc g 21

<210> 65
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 65
gtcgcaaagg catacctgct 20

<210> 66
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 66
acagagcctc tgctaagaag 20

<210> 67
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 67
gcagctgttg acaatcatc 19

<210> 68
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 68
tatgaggaga gggcttgact 20

<210> 69
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 69
agcagacgtg ctaggaggt 19

<210> 70
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 70
tcctcttgct gtttgcatc 19

<210> 71
<211> 20
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 71
cagacactca gaacagagac 20

<210> 72
<211> 20

<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 72
amatcgtcta acccacctag 20

<210> 73
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 73
ctcgtttctg gtcatacctg a 21

<210> 74
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer

<400> 74
gagtacatct ctctaggca 19

<210> 75
<211> 524
<212> PRT
<213> Porcine endogenous retrovirus

<400> 75
Met Gly Gln Thr Val Thr Thr Pro Leu Ser Leu Thr Leu Asp His Trp
1 5 10 15
Thr Glu Val Arg Ser Arg Ala His Asn Leu Ser Val Gln Val Lys Lys
20 25 30
Gly Pro Trp Gln Thr Phe Cys Ala Ser Glu Trp Pro Thr Phe Asp Val
35 40 45
Gly Trp Pro Ser Glu Gly Thr Phe Asn Ser Glu Ile Ile Leu Ala Val
50 55 60
Lys Ala Ile Ile Phe Gln Thr Gly Pro Gly Ser His Pro Asp Gln Glu
65 70 75 80
Pro Tyr Ile Leu Thr Trp Gln Asp Leu Ala Glu Asp Pro Pro Pro Trp
85 90 95
Val Lys Pro Trp Leu Asn Lys Pro Arg Lys Pro Gly Pro Arg Ile Leu
100 105 110
Ala Leu Gly Glu Lys Asn Lys His Ser Ala Glu Lys Val Glu Pro Ser
115 120 125
Pro Arg Ile Tyr Pro Glu Ile Glu Glu Pro Pro Thr Trp Pro Glu Pro
130 135 140
Gln Pro Val Pro Pro Pro Pro Tyr Pro Ala Gln Gly Ala Val Arg Gly
145 150 155 160

```
Pro Ser Ala Pro Pro Gly Ala Pro Val Val Glu Gly Pro Ala Ala Gly
                165                 170                 175
Thr Arg Ser Arg Arg Gly Ala Thr Pro Glu Arg Thr Asp Glu Ile Ala
            180                 185                 190
Ile Leu Pro Leu Arg Thr Tyr Gly Pro Pro Met Pro Gly Gly Gln Leu
        195                 200                 205
Gln Pro Leu Gln Tyr Trp Pro Phe Ser Ser Ala Asp Leu Tyr Asn Trp
    210                 215                 220
Lys Thr Asn His Pro Pro Phe Ser Glu Asp Pro Gln Arg Leu Thr Gly
225                 230                 235                 240
Leu Val Glu Ser Leu Met Phe Ser His Gln Pro Thr Trp Asp Asp Cys
                245                 250                 255
Gln Gln Leu Leu Gln Thr Leu Phe Thr Thr Glu Glu Arg Glu Arg Ile
            260                 265                 270
Leu Leu Glu Ala Lys Lys Asn Val Pro Gly Ala Asp Gly Arg Pro Thr
        275                 280                 285
Gln Leu Gln Asn Glu Ile Asp Met Gly Phe Pro Leu Thr Arg Pro Gly
    290                 295                 300
Trp Asp Tyr Asn Thr Ala Glu Gly Arg Glu Ser Leu Lys Ile Tyr Arg
305                 310                 315                 320
Gln Ala Leu Val Ala Gly Leu Arg Gly Ala Ser Arg Arg Pro Thr Asn
                325                 330                 335
Leu Ala Lys Val Arg Glu Val Met Gln Gly Pro Asn Glu Pro Pro Ser
            340                 345                 350
Val Phe Leu Glu Arg Leu Met Glu Ala Phe Arg Arg Phe Thr Pro Phe
        355                 360                 365
Asp Pro Thr Ser Glu Ala Gln Lys Ala Ser Val Ala Leu Ala Phe Ile
    370                 375                 380
Gly Gln Ser Ala Leu Asp Ile Arg Lys Lys Leu Gln Arg Leu Glu Gly
385                 390                 395                 400
Leu Gln Glu Ala Glu Leu Arg Asp Leu Val Arg Glu Ala Glu Lys Val
                405                 410                 415
Tyr Tyr Arg Arg Glu Thr Glu Glu Glu Lys Glu Gln Arg Lys Glu Lys
            420                 425                 430
Glu Arg Glu Glu Arg Glu Glu Arg Arg Asp Arg Arg Gln Glu Lys Asn
        435                 440                 445
Leu Thr Lys Ile Leu Ala Ala Val Val Glu Gly Lys Ser Ser Arg Glu
    450                 455                 460
Arg Glu Arg Asp Phe Arg Lys Ile Arg Ser Gly Pro Arg Gln Ser Gly
465                 470                 475                 480
Asn Leu Gly Asn Arg Thr Pro Leu Asp Lys Asp Gln Cys Ala Tyr Cys
                485                 490                 495
Lys Glu Lys Gly His Trp Ala Arg Asn Cys Pro Lys Lys Gly Asn Lys
            500                 505                 510
Gly Pro Lys Val Leu Ala Leu Glu Glu Asp Lys Asp
        515                 520
```

<210> 76
<211> 401
<212> PRT
<213> Porcine endogenous retrovirus

<400> 76

```
Met Gly Ala Thr Gly Gln Arg Gln Tyr Pro Trp Thr Thr Arg Arg Thr
 1               5                  10                  15
Val Asp Leu Gly Val Gly Arg Val Thr His Ser Phe Leu Val Ile Pro
```

```
            20                  25                  30
Glu Cys Pro Val Pro Leu Leu Gly Arg Asp Leu Leu Thr Lys Met Gly
        35                  40                  45
Ala Gln Ile Ser Phe Glu Gln Gly Arg Pro Glu Val Ser Val Asn Asn
    50                  55                  60
Lys Pro Ile Thr Val Leu Leu Thr Leu Gln Leu Asp Asp Glu Tyr Arg Leu
65                  70                  75                  80
Tyr Ser Pro Gln Val Lys Pro Asp Gln Asp Ile Gln Ser Trp Leu Glu
                85                  90                  95
Gln Phe Pro Gln Ala Trp Ala Glu Thr Ala Gly Met Gly Leu Ala Lys
            100                 105                 110
Gln Val Pro Pro Gln Val Ile Gln Leu Lys Ala Ser Ala Thr Pro Val
        115                 120                 125
Ser Val Arg Gln Tyr Pro Leu Ser Arg Glu Ala Arg Glu Gly Ile Trp
    130                 135                 140
Pro His Val Gln Arg Leu Ile Gln Gln Gly Ile Leu Val Pro Val Gln
145                 150                 155                 160
Ser Pro Trp Asn Thr Pro Leu Leu Pro Val Arg Lys Pro Gly Thr Asn
                165                 170                 175
Asp Tyr Arg Pro Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Gln
            180                 185                 190
Asp Ile His Pro Thr Val Pro Asn Pro Tyr Asn Leu Leu Ser Ala Leu
        195                 200                 205
Pro Pro Glu Arg Asn Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe
    210                 215                 220
Phe Cys Leu Arg Leu His Pro Thr Ser Gln Pro Leu Phe Thr Phe Glu
225                 230                 235                 240
Trp Arg Asp Pro Gly Thr Gly Arg Thr Gly Gln Leu Thr Trp Thr Arg
                245                 250                 255
Leu Pro Gln Gly Phe Lys Asn Ser Pro Thr Ile Phe Asp Glu Ala Leu
            260                 265                 270
His Arg Asp Leu Ala Asn Phe Arg Ile Gln His Pro Gln Val Thr Leu
        275                 280                 285
Leu Gln Tyr Val Asp Asp Leu Leu Leu Ala Gly Ala Thr Lys Gln Asp
    290                 295                 300
Cys Leu Glu Gly Thr Lys Ala Leu Leu Leu Glu Leu Ser Asp Leu Gly
305                 310                 315                 320
Tyr Arg Ala Ser Ala Lys Lys Ala Gln Ile Cys Arg Arg Glu Val Thr
                325                 330                 335
Tyr Leu Gly Tyr Ser Leu Arg Gly Gly Gln Arg Trp Leu Thr Glu Ala
            340                 345                 350
Arg Lys Lys Thr Val Val Gln Ile Pro Ala Pro Thr Thr Ala Lys Gln
        355                 360                 365
Val Arg Glu Phe Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro
    370                 375                 380
Gly Phe Ala Thr Leu Ala Ala Pro Leu Tyr Pro Leu Thr Lys Glu Lys
385                 390                 395                 400
Gly
```

<210> 77
<211> 271
<212> PRT
<213> Porcine endogenous retrovirus

<400> 77

```
Lys Arg Gly Leu Leu Thr Ser Ala Gly Arg Glu Ile Lys Asn Lys Glu
 1               5                  10                  15
Gln Ile Leu Ser Leu Leu Glu Ala Leu His Leu Pro Lys Arg Leu Ala
            20                  25                  30
Ile Ile His Cys Pro Gly His Gln Lys Ala Lys Asp Leu Ile Ser Arg
        35                  40                  45
Gly Asn Gln Met Ala Asp Arg Val Ala Lys Gln Ala Ala Gln Ala Val
    50                  55                  60
Asn Leu Leu Pro Ile Ile Glu Thr Pro Lys Ala Pro Glu Pro Arg Arg
65                  70                  75                  80
Gln Tyr Thr Leu Glu Asp Trp Gln Glu Ile Lys Lys Ile Asp Gln Phe
                85                  90                  95
Ser Glu Thr Pro Glu Gly Thr Cys Tyr Thr Ser Tyr Gly Lys Glu Ile
            100                 105                 110
Leu Pro His Lys Glu Gly Leu Glu Tyr Val Gln Gln Ile His Arg Leu
        115                 120                 125
Thr His Leu Gly Thr Lys His Leu Gln Gln Leu Val Arg Thr Ser Pro
    130                 135                 140
Tyr His Val Leu Arg Leu Pro Gly Val Ala Asp Ser Val Val Lys His
145                 150                 155                 160
Cys Val Pro Cys Gln Leu Val Asn Ala Asn Pro Ser Arg Ile Pro Pro
                165                 170                 175
Gly Lys Arg Leu Arg Gly Ser His Pro Gly Ala His Trp Glu Val Asp
            180                 185                 190
Phe Thr Glu Val Lys Pro Ala Lys Tyr Gly Asn Lys Tyr Leu Leu Val
        195                 200                 205
Phe Val Asp Thr Phe Ser Gly Trp Val Glu Ala Tyr Pro Thr Lys Lys
    210                 215                 220
Glu Thr Ser Thr Val Val Ala Lys Lys Ile Leu Glu Glu Ile Phe Pro
225                 230                 235                 240
Arg Phe Gly Ile Pro Lys Val Ile Gly Ser Asp Asn Gly Pro Ala Phe
                245                 250                 255
Val Ala Gln Val Ser Gln Gly Leu Ala Lys Ile Leu Gly Ile Asp
            260                 265                 270
```

<210> 78
<211> 139
<212> PRT
<213> Porcine endogenous retrovirus

<400> 78

```
Lys Leu His Cys Ala Tyr Arg Pro Gln Ser Ser Gly Gln Val Glu Arg
 1               5                  10                  15
Met Asn Arg Thr Ile Lys Glu Thr Leu Thr Lys Leu Thr Thr Glu Thr
            20                  25                  30
Gly Ile Asn Asp Trp Met Ala Leu Leu Pro Phe Val Leu Phe Arg Val
        35                  40                  45
Arg Asn Thr Pro Gly Gln Phe Gly Leu Thr Pro Tyr Lys Leu Leu Tyr
    50                  55                  60
Gly Gly Pro Pro Pro Leu Ala Glu Ile Ala Phe Ala His Ser Ala Asp
65                  70                  75                  80
Val Leu Leu Ser Gln Pro Leu Phe Ser Arg Leu Lys Ala Leu Glu Trp
                85                  90                  95
Val Arg Gln Arg Ala Trp Lys Gln Leu Arg Gln Ala Tyr Ser Gly Gly
            100                 105                 110
Asp Leu Gln Val Pro His Arg Phe Gln Val Gly Asp Ser Val Tyr Val
```

```
        115                 120                 125
Arg Arg His Arg Ala Gly Asn Leu Glu Thr Arg
    130                 135


<210> 79
<211> 657
<212> PRT
<213> Porcine endogenous retrovirus

<400> 79
Lys Gly Pro Tyr Leu Val Leu Leu Thr Thr Pro Thr Ala Val Lys Val
 1               5                  10                  15
Glu Gly Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe Leu Thr Leu
            20                  25                  30
Ser Ile Thr Pro Gln Val Asn Gly Lys Arg Leu Val Asp Ser Pro Asn
        35                  40                  45
Ser His Lys Pro Leu Ser Leu Thr Trp Leu Leu Thr Asp Ser Gly Thr
    50                  55                  60
Gly Ile Asn Ile Asn Ser Thr Gln Gly Glu Ala Pro Leu Gly Thr Trp
65                  70                  75                  80
Trp Pro Glu Leu Tyr Val Cys Leu Arg Ser Val Ile Pro Gly Leu Asn
                85                  90                  95
Asp Gln Ala Thr Pro Pro Asp Val Leu Arg Ala Tyr Gly Phe Tyr Val
            100                 105                 110
Cys Pro Gly Pro Pro Asn Asn Glu Glu Tyr Cys Gly Asn Pro Gln Asp
        115                 120                 125
Phe Phe Cys Lys Gln Trp Ser Cys Ile Thr Ser Asn Asp Gly Asn Trp
    130                 135                 140
Lys Trp Pro Val Ser Gln Gln Asp Arg Val Ser Tyr Ser Phe Val Asn
145                 150                 155                 160
Asn Pro Thr Ser Tyr Asn Gln Phe Asn Tyr Gly His Gly Arg Trp Lys
                165                 170                 175
Asp Trp Gln Gln Arg Val Gln Lys Asp Val Arg Asn Lys Gln Ile Ser
            180                 185                 190
Cys His Ser Leu Asp Leu Asp Tyr Leu Lys Ile Ser Phe Thr Glu Lys
        195                 200                 205
Gly Lys Gln Glu Asn Ile Gln Lys Trp Val Asn Gly Ile Ser Trp Gly
    210                 215                 220
Ile Val Tyr Tyr Gly Gly Ser Gly Arg Lys Lys Gly Ser Val Leu Thr
225                 230                 235                 240
Ile Arg Leu Arg Ile Glu Thr Gln Met Glu Pro Pro Val Ala Ile Gly
                245                 250                 255
Pro Asn Lys Gly Leu Ala Glu Gln Gly Pro Pro Ile Gln Glu Gln Arg
            260                 265                 270
Pro Ser Pro Asn Pro Ser Asp Tyr Asn Thr Thr Ser Gly Ser Val Pro
        275                 280                 285
Thr Glu Pro Asn Ile Thr Ile Lys Thr Gly Ala Lys Leu Phe Ser Leu
    290                 295                 300
Ile Gln Gly Ala Phe Gln Ala Leu Asn Ser Thr Thr Pro Glu Ala Thr
305                 310                 315                 320
Ser Ser Cys Trp Leu Cys Leu Ala Ser Gly Pro Pro Tyr Tyr Glu Gly
                325                 330                 335
Met Ala Arg Gly Gly Lys Phe Asn Val Thr Lys Glu His Arg Asp Gln
            340                 345                 350
Cys Thr Trp Gly Ser Gln Asn Lys Leu Thr Leu Thr Glu Val Ser Gly
        355                 360                 365
```

```
Lys Gly Thr Cys Ile Gly Met Val Pro Pro Ser His Gln His Leu Cys
    370                 375                 380
Asn His Thr Glu Ala Phe Asn Arg Thr Ser Glu Ser Gln Tyr Leu Val
385                 390                 395                 400
Pro Gly Tyr Asp Arg Trp Trp Ala Cys Asn Thr Gly Leu Thr Pro Cys
                405                 410                 415
Val Ser Thr Leu Val Phe Asn Gln Thr Lys Asp Phe Cys Val Met Val
            420                 425                 430
Gln Ile Val Pro Arg Val Tyr Tyr Tyr Pro Glu Lys Ala Val Leu Asp
        435                 440                 445
Glu Tyr Asp Tyr Arg Tyr Asn Arg Pro Lys Arg Glu Pro Ile Ser Leu
    450                 455                 460
Thr Leu Ala Val Met Leu Gly Leu Gly Val Ala Ala Gly Val Gly Thr
465                 470                 475                 480
Gly Thr Ala Ala Leu Ile Thr Gly Pro Gln Gln Leu Glu Lys Gly Leu
                485                 490                 495
Ser Asn Leu His Arg Ile Val Thr Glu Asp Leu Gln Ala Leu Glu Lys
            500                 505                 510
Ser Val Ser Asn Leu Glu Glu Ser Leu Thr Ser Leu Ser Glu Val Val
        515                 520                 525
Leu Gln Asn Arg Arg Gly Leu Asp Leu Leu Phe Leu Lys Glu Gly Gly
    530                 535                 540
Leu Cys Val Ala Leu Lys Glu Glu Cys Cys Phe Tyr Val Asp His Ser
545                 550                 555                 560
Gly Ala Ile Arg Asp Ser Met Ser Lys Leu Arg Glu Arg Leu Glu Arg
                565                 570                 575
Arg Arg Arg Glu Arg Glu Ala Asp Gln Gly Trp Phe Glu Gly Trp Phe
            580                 585                 590
Asn Arg Ser Pro Trp Met Thr Thr Leu Leu Ser Ala Leu Thr Gly Pro
        595                 600                 605
Leu Val Val Leu Leu Leu Leu Leu Thr Val Gly Pro Cys Leu Ile Asn
    610                 615                 620
Arg Phe Val Ala Phe Val Arg Glu Arg Val Ser Ala Val Gln Ile Met
625                 630                 635                 640
Val Leu Arg Gln Gln Tyr Gln Gly Leu Leu Ser Gln Gly Glu Thr Asp
                645                 650                 655
Leu
```

<210> 80
<211> 524
<212> PRT
<213> Porcine endogenous retrovirus

<400> 80

```
Met Gly Gln Thr Val Thr Thr Pro Leu Ser Leu Thr Leu Asp His Trp
 1               5                  10                  15
Thr Glu Val Lys Ser Arg Ala His Asn Leu Ser Val Gln Val Lys Lys
            20                  25                  30
Gly Pro Trp Gln Thr Phe Cys Val Ser Glu Trp Pro Thr Phe Asp Val
        35                  40                  45
Gly Trp Pro Ser Glu Gly Thr Phe Asn Ser Gln Ile Ile Leu Ala Val
    50                  55                  60
Lys Ala Val Ile Phe Gln Thr Gly Pro Gly Ser His Pro Asp Gln Glu
65                  70                  75                  80
Pro Tyr Ile Leu Thr Trp Gln Asp Leu Ala Glu Asp Pro Pro Pro Trp
```

```
                85                  90                  95
Val Lys Pro Trp Leu Asn Lys Pro Arg Lys Pro Gly Pro Arg Ile Leu
            100                 105                 110
Ala Leu Gly Glu Lys Asn Lys His Ser Ala Glu Lys Val Lys Pro Ser
        115                 120                 125
Pro His Ile Tyr Pro Glu Ile Glu Glu Pro Pro Ala Trp Pro Glu Pro
    130                 135                 140
Gln Ser Val Pro Pro Pro Pro Tyr Leu Ala Gln Gly Ala Ala Arg Gly
145                 150                 155                 160
Pro Phe Ala Pro Pro Gly Ala Pro Ala Val Glu Gly Pro Ala Ala Gly
                165                 170                 175
Thr Arg Ser Arg Arg Arg Gly Ala Thr Pro Glu Arg Thr Asp Glu Ile Ala
            180                 185                 190
Thr Leu Pro Leu Arg Thr Tyr Gly Pro Pro Thr Pro Gly Gly Gln Leu
        195                 200                 205
Gln Pro Leu Gln Tyr Trp Pro Phe Ser Ser Ala Asp Leu Tyr Asn Trp
    210                 215                 220
Lys Thr Asn His Pro Pro Phe Ser Glu Asp Pro Gln Arg Leu Thr Gly
225                 230                 235                 240
Leu Val Glu Ser Leu Met Phe Ser His Gln Pro Thr Trp Asp Asp Cys
                245                 250                 255
Gln Gln Leu Leu Gln Thr Leu Phe Thr Thr Glu Glu Arg Glu Arg Ile
            260                 265                 270
Leu Leu Glu Ala Arg Lys Asn Val Pro Gly Ala Asp Gly Arg Pro Thr
        275                 280                 285
Arg Leu Gln Asn Glu Ile Asp Met Gly Phe Pro Leu Thr Arg Pro Gly
    290                 295                 300
Trp Asp Tyr Asn Thr Ala Glu Gly Arg Glu Ser Leu Lys Ile Tyr Arg
305                 310                 315                 320
Gln Ala Leu Val Ala Gly Leu Arg Gly Ala Ser Arg Arg Pro Thr Asn
                325                 330                 335
Leu Ala Lys Val Arg Glu Val Met Gln Gly Pro Asn Glu Pro Pro Ser
            340                 345                 350
Val Phe Leu Glu Arg Leu Leu Glu Ala Phe Arg Arg Tyr Thr Pro Phe
        355                 360                 365
Asp Pro Thr Ser Glu Ala Gln Lys Ala Ser Val Ala Leu Ala Phe Ile
    370                 375                 380
Gly Gln Ser Ala Leu Asp Ile Arg Lys Lys Leu Gln Arg Leu Glu Gly
385                 390                 395                 400
Leu Gln Glu Ala Glu Leu Arg Asp Leu Val Lys Glu Ala Glu Lys Val
                405                 410                 415
Tyr Tyr Lys Arg Glu Thr Glu Glu Glu Arg Glu Gln Arg Lys Glu Arg
            420                 425                 430
Glu Arg Glu Glu Arg Glu Glu Arg Arg Asn Lys Arg Gln Glu Lys Asn
        435                 440                 445
Leu Thr Lys Ile Leu Ala Ala Val Val Glu Gly Lys Ser Asn Thr Glu
    450                 455                 460
Arg Glu Arg Asp Phe Arg Lys Ile Arg Ser Gly Pro Arg Gln Ser Gly
465                 470                 475                 480
Asn Leu Gly Asn Arg Thr Pro Leu Asp Lys Asp Gln Cys Ala Tyr Cys
                485                 490                 495
Lys Glu Arg Gly His Trp Ala Arg Asn Cys Pro Lys Lys Gly Asn Lys
            500                 505                 510
Gly Pro Arg Ile Leu Ala Leu Glu Glu Asp Lys Asp
        515                 520
```

<210> 81
<211> 1148
<212> PRT
<213> Porcine endogenous retrovirus

<400> 81

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Met Gly Ala Thr Gly Gln Gln Gln Tyr Pro Trp Thr Thr Arg Arg Thr
 1               5                  10                  15
Val Asp Leu Gly Val Gly Arg Val Thr His Ser Phe Leu Val Ile Pro
            20                  25                  30
Glu Cys Pro Ala Pro Leu Leu Gly Arg Asp Leu Leu Thr Lys Met Gly
        35                  40                  45
Ala Gln Ile Ser Phe Glu Gln Gly Lys Pro Glu Val Ser Ala Asn Asn
    50                  55                  60
Lys Pro Ile Thr Val Leu Thr Leu Gln Leu Asp Asp Glu Tyr Arg Leu
65                  70                  75                  80
Tyr Ser Pro Leu Val Lys Pro Asp Gln Asn Ile Gln Phe Trp Leu Glu
                85                  90                  95
Gln Phe Pro Gln Ala Trp Ala Glu Thr Ala Gly Met Gly Leu Ala Lys
            100                 105                 110
Gln Val Pro Pro Gln Val Ile Gln Leu Lys Ala Ser Ala Thr Pro Val
        115                 120                 125
Ser Val Arg Gln Tyr Pro Leu Ser Lys Glu Ala Gln Glu Gly Ile Arg
    130                 135                 140
Pro His Val Gln Arg Leu Ile Gln Gln Gly Ile Leu Val Pro Val Gln
145                 150                 155                 160
Ser Pro Trp Asn Thr Pro Leu Leu Pro Val Arg Lys Pro Gly Thr Asn
                165                 170                 175
Asp Tyr Arg Pro Val Gln Asp Leu Arg Glu Val Asn Lys Arg Val Gln
            180                 185                 190
Asp Ile His Pro Thr Val Pro Asn Pro Tyr Asn Leu Leu Cys Ala Leu
        195                 200                 205
Pro Pro Gln Arg Ser Trp Tyr Thr Val Leu Asp Leu Lys Asp Ala Phe
    210                 215                 220
Phe Cys Leu Arg Leu His Pro Thr Ser Gln Pro Leu Phe Ala Phe Glu
225                 230                 235                 240
Trp Arg Asp Pro Gly Thr Gly Arg Thr Gly Gln Leu Thr Trp Thr Arg
                245                 250                 255
Leu Pro Gln Gly Phe Lys Asn Ser Pro Thr Ile Phe Asp Glu Ala Leu
            260                 265                 270
His Arg Asp Leu Ala Asn Phe Arg Ile Gln His Pro Gln Val Thr Leu
        275                 280                 285
Leu Gln Tyr Val Asp Asp Leu Leu Leu Ala Gly Ala Thr Lys Gln Asp
    290                 295                 300
Cys Leu Glu Gly Thr Lys Ala Leu Leu Leu Glu Glu Leu Ser Asp Leu Gly
305                 310                 315                 320
Tyr Arg Ala Ser Ala Lys Lys Ala Gln Ile Cys Arg Arg Glu Val Thr
                325                 330                 335
Tyr Leu Gly Tyr Ser Leu Arg Asp Gly Gln Arg Trp Leu Thr Glu Ala
            340                 345                 350
Arg Lys Lys Thr Val Val Gln Ile Pro Ala Pro Thr Thr Ala Lys Gln
        355                 360                 365
Met Arg Glu Phe Leu Gly Thr Ala Gly Phe Cys Arg Leu Trp Ile Pro
    370                 375                 380
Gly Phe Ala Thr Leu Ala Ala Pro Leu Tyr Pro Leu Thr Lys Glu Lys
385                 390                 395                 400
Gly Glu Phe Ser Trp Ala Pro Glu His Gln Lys Ala Phe Asp Ala Ile
```

```
                405                 410                 415
Lys Lys Ala Leu Leu Ser Ala Pro Ala Leu Ala Leu Pro Asp Val Thr
            420                 425                 430
Lys Pro Phe Thr Leu Tyr Val Asp Glu Arg Lys Gly Val Ala Arg Gly
        435                 440                 445
Val Leu Thr Gln Thr Leu Gly Pro Trp Arg Arg Pro Val Ala Tyr Leu
    450                 455                 460
Ser Lys Lys Leu Asp Pro Val Ala Ser Gly Trp Pro Ile Cys Leu Lys
465                 470                 475                 480
Ala Ile Ala Ala Val Ala Ile Leu Val Lys Asp Ala Asp Lys Leu Thr
                485                 490                 495
Leu Gly Gln Asn Ile Thr Val Ile Ala Pro His Ala Leu Glu Asn Ile
            500                 505                 510
Val Arg Gln Pro Pro Asp Arg Trp Met Thr Asn Ala Arg Met Thr His
        515                 520                 525
Tyr Gln Ser Leu Leu Leu Thr Glu Arg Val Thr Phe Ala Pro Pro Ala
    530                 535                 540
Ala Leu Asn Pro Ala Thr Leu Leu Pro Glu Glu Thr Asp Glu Pro Val
545                 550                 555                 560
Thr His Asp Cys His Gln Leu Leu Ile Glu Glu Thr Gly Val Arg Lys
                565                 570                 575
Asp Leu Thr Asp Ile Pro Leu Thr Gly Glu Val Leu Thr Trp Phe Thr
            580                 585                 590
Asp Gly Ser Ser Tyr Val Val Glu Gly Lys Arg Met Ala Gly Ala Ala
        595                 600                 605
Val Val Asp Gly Thr Arg Thr Ile Trp Ala Ser Ser Leu Pro Glu Gly
    610                 615                 620
Thr Ser Ala Gln Lys Ala Glu Leu Met Ala Leu Thr Gln Ala Leu Arg
625                 630                 635                 640
Leu Ala Glu Gly Lys Ser Ile Asn Ile Tyr Thr Asp Ser Arg Tyr Ala
                645                 650                 655
Phe Ala Thr Ala His Val His Gly Ala Ile Tyr Lys Gln Arg Gly Leu
            660                 665                 670
Leu Thr Ser Ala Gly Arg Glu Ile Lys Asn Lys Glu Glu Ile Leu Ser
        675                 680                 685
Leu Leu Glu Ala Val His Leu Pro Lys Arg Leu Ala Ile Ile His Cys
    690                 695                 700
Pro Gly His Gln Lys Ala Lys Asp Leu Ile Ser Arg Gly Asn Gln Met
705                 710                 715                 720
Ala Asp Arg Val Ala Lys Gln Ala Ala Gln Gly Val Asn Leu Leu Pro
                725                 730                 735
Ile Ile Glu Met Pro Lys Ala Pro Glu Pro Arg Arg Gln Tyr Thr Leu
            740                 745                 750
Glu Asp Trp Gln Glu Ile Lys Lys Ile Asp Gln Phe Ser Glu Thr Pro
        755                 760                 765
Glu Gly Thr Cys Tyr Thr Ser Asp Gly Lys Glu Ile Leu Pro His Lys
    770                 775                 780
Glu Gly Leu Glu Tyr Val Gln Gln Ile His Arg Leu Thr His Leu Gly
785                 790                 795                 800
Thr Lys His Leu Gln Gln Leu Val Arg Thr Ser Pro Tyr His Val Leu
                805                 810                 815
Arg Leu Pro Gly Val Ala Asp Ser Val Val Lys His Cys Val Pro Cys
            820                 825                 830
Gln Leu Val Asn Ala Asn Pro Ser Arg Met Pro Pro Gly Lys Arg Leu
        835                 840                 845
Arg Gly Ser His Pro Gly Ala His Trp Glu Val Asp Phe Thr Glu Val
    850                 855                 860
```

```
Lys Pro Ala Lys Tyr Gly Asn Lys Tyr Leu Leu Val Phe Val Asp Thr
865                 870                 875                 880
Phe Ser Gly Trp Val Glu Ala Tyr Pro Thr Lys Lys Glu Thr Ser Thr
                885                 890                 895
Val Val Ala Lys Lys Ile Leu Glu Glu Ile Phe Pro Arg Phe Gly Ile
            900                 905                 910
Pro Lys Val Ile Gly Ser Asp Asn Gly Pro Ala Phe Val Ala Gln Val
        915                 920                 925
Ser Gln Gly Leu Ala Lys Ile Leu Gly Ile Asp Trp Lys Leu His Cys
    930                 935                 940
Ala Tyr Arg Pro Gln Ser Ser Gly Gln Val Glu Arg Met Asn Arg Thr
945                 950                 955                 960
Ile Lys Glu Thr Leu Thr Lys Leu Thr Ala Glu Thr Gly Val Asn Asp
                965                 970                 975
Trp Ile Ala Leu Leu Pro Phe Val Leu Phe Arg Val Arg Asn Thr Pro
            980                 985                 990
Gly Gln Phe Gly Leu Thr Pro Tyr Glu Leu Leu Tyr Gly Gly Pro Pro
        995                 1000                1005
Pro Leu Val Glu Ile Ala Ser Val His Ser Ala Asp Val Leu Leu Ser
    1010                1015                1020
Gln Pro Leu Phe Ser Arg Leu Lys Ala Leu Glu Trp Val Arg Gln Arg
1025                1030                1035                1040
Ala Trp Arg Gln Leu Arg Glu Ala Tyr Ser Gly Gly Gly Asp Leu Gln
                1045                1050                1055
Ile Pro His Arg Phe Gln Val Gly Asp Ser Val Tyr Val Arg Arg His
            1060                1065                1070
Arg Ala Gly Asn Leu Glu Thr Arg Trp Lys Gly Pro Tyr Leu Val Leu
        1075                1080                1085
Leu Thr Thr Pro Thr Ala Val Lys Val Glu Gly Ile Ser Thr Trp Ile
    1090                1095                1100
His Ala Ser His Val Lys Pro Ala Pro Pro Pro Asp Ser Gly Trp Lys
1105                1110                1115                1120
Ala Glu Lys Thr Glu Asn Pro Leu Lys Leu Arg Leu His Arg Val Val
                1125                1130                1135
Pro Tyr Ser Val Asn Asn Leu Ser Asp
            1140                1145
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<210> 82
<211> 638
<212> PRT
<213> Porcine endogenous retrovirus

<400> 82

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Met His Pro Thr Leu Asn Arg Arg His Leu Pro Ile Arg Gly Gly Lys
 1               5                  10                  15
Pro Lys Arg Leu Lys Ile Pro Leu Ser Phe Ala Ser Ile Ala Trp Phe
            20                  25                  30
Leu Thr Leu Ser Ile Thr Ser Gln Thr Asn Gly Met Arg Ile Gly Asp
        35                  40                  45
Ser Leu Asn Ser His Lys Pro Leu Ser Leu Thr Trp Leu Ile Thr Asp
    50                  55                  60
Ser Gly Thr Gly Ile Asn Ile Asn Asn Thr Gln Gly Glu Ala Pro Leu
65                  70                  75                  80
Gly Thr Trp Trp Pro Asp Leu Tyr Val Cys Leu Arg Ser Val Ile Pro
                85                  90                  95
Ser Leu Thr Ser Pro Pro Asp Ile Leu His Ala His Gly Phe Tyr Val
```

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            100                 105                 110
Cys Pro Gly Pro Pro Asn Asn Gly Lys His Cys Gly Asn Pro Arg Asp
        115                 120                 125
Phe Phe Cys Lys Gln Trp Asn Cys Val Thr Ser Asn Asp Gly Tyr Trp
    130                 135                 140
Lys Trp Pro Thr Ser Gln Gln Asp Arg Val Ser Phe Ser Tyr Val Asn
145                 150                 155                 160
Thr Tyr Thr Ser Ser Gly Gln Phe Asn Tyr Leu Thr Trp Ile Arg Thr
                165                 170                 175
Gly Ser Pro Lys Cys Ser Pro Ser Asp Leu Asp Tyr Leu Lys Ile Ser
            180                 185                 190
Phe Thr Glu Lys Gly Lys Gln Glu Asn Ile Leu Lys Trp Val Asn Gly
        195                 200                 205
Met Ser Trp Gly Met Val Tyr Tyr Gly Gly Ser Gly Lys Gln Pro Gly
    210                 215                 220
Ser Ile Leu Thr Ile Arg Leu Lys Ile Asn Gln Leu Glu Pro Pro Met
225                 230                 235                 240
Ala Ile Gly Pro Asn Thr Val Leu Thr Gly Gln Arg Pro Pro Thr Gln
                245                 250                 255
Gly Pro Gly Pro Ser Ser Asn Ile Thr Ser Gly Ser Asp Pro Thr Glu
            260                 265                 270
Ser Asn Ser Thr Thr Lys Met Gly Ala Lys Leu Phe Ser Leu Ile Gln
        275                 280                 285
Gly Ala Phe Gln Ala Leu Asn Ser Thr Thr Pro Glu Ala Thr Ser Ser
    290                 295                 300
Cys Trp Leu Cys Leu Ala Ser Gly Pro Pro Tyr Tyr Glu Gly Met Ala
305                 310                 315                 320
Arg Arg Gly Lys Phe Asn Val Thr Lys Glu His Arg Asp Gln Cys Thr
                325                 330                 335
Trp Gly Ser Gln Asn Lys Leu Thr Leu Thr Glu Val Ser Gly Lys Gly
            340                 345                 350
Thr Cys Ile Gly Lys Val Pro Pro Ser His Gln His Leu Cys Asn His
        355                 360                 365
Thr Glu Ala Phe Asn Gln Thr Ser Glu Ser Gln Tyr Leu Val Pro Gly
    370                 375                 380
Tyr Asp Arg Trp Trp Ala Cys Asn Thr Gly Leu Thr Pro Cys Val Ser
385                 390                 395                 400
Thr Leu Val Phe Asn Gln Thr Lys Asp Phe Cys Ile Met Val Gln Ile
                405                 410                 415
Val Pro Arg Val Tyr Tyr Tyr Pro Glu Lys Ala Ile Leu Asp Glu Tyr
            420                 425                 430
Asp Tyr Arg Asn His Arg Gln Lys Arg Glu Pro Ile Ser Leu Thr Leu
        435                 440                 445
Ala Val Met Leu Gly Leu Gly Val Ala Ala Gly Val Gly Thr Gly Thr
    450                 455                 460
Ala Ala Leu Val Thr Gly Pro Gln Gln Leu Glu Thr Gly Leu Ser Asn
465                 470                 475                 480
Leu His Arg Ile Val Thr Glu Asp Leu Gln Ala Leu Glu Lys Ser Val
                485                 490                 495
Ser Asn Leu Glu Glu Ser Leu Thr Ser Leu Ser Glu Val Val Leu Gln
            500                 505                 510
Asn Arg Arg Gly Leu Asp Leu Leu Phe Leu Lys Glu Gly Gly Leu Cys
        515                 520                 525
Val Ala Leu Lys Glu Glu Cys Cys Phe Tyr Val Asp His Ser Gly Ala
    530                 535                 540
Ile Arg Asp Ser Met Asn Lys Leu Arg Glu Arg Leu Glu Lys Arg Arg
545                 550                 555                 560
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Arg Glu Lys Glu Thr Thr Gln Gly Trp Phe Glu Gly Trp Phe Asn Arg
                565                 570                 575
Ser Leu Trp Leu Ala Thr Leu Leu Ser Ala Leu Thr Gly Pro Leu Ile
            580                 585                 590
Val Leu Leu Leu Leu Leu Thr Val Gly Pro Cys Ile Ile Asn Lys Leu
        595                 600                 605
Ile Ala Phe Ile Arg Glu Arg Ile Ser Ala Val Gln Ile Met Val Leu
    610                 615                 620
Arg Gln Gln Tyr Gln Ser Pro Ser Ser Arg Glu Ala Gly Arg
625                 630                 635
```